



Strathmore
UNIVERSITY

SCHOOL OF COMPUTING AND ENGINEERING SCIENCES
BACHELORS IN ELECTRICAL AND ELECTRONIC ENGINEERING
END OF SEMESTER EXAMINATION
BEE 2301: ELECTRICAL INSTALLATION

DATE: 26th July 2024

Time: 10:30-14:00 HOURS

Instructions

1. This is a practical examination.
2. Answer all the questions
3. Use the answer booklet provided to show your calculation. Document all the steps followed.
4. The .dwg drawing should be saved using your **STD. REGISTRATION NUMBER.**
5. Take the height of the room as 3000mm and the standard height as 2850mm.

Questions

- a. Calculate the quantity of the following, showing your working. Draw the equipment on the drawing provided.
- i. Lighting (10marks)
 - ii. Cameras (5marks)
 - iii. Smoke detectors (5marks)
 - iv. Sockets(3marks)
 - v. Exits and Emergency Exits (3marks)
- b. Provide a load schedule for the above calculations in a table format. (Indicate quantity, number of hours, and approximate wattage) (10marks)
- c. Draw the power diagram showing the cable sizes, circuit breaker size and type, distribution boards and any other protection devices needed and label it as **Diagram no.2: Power Diagram.** (10marks)
- d. Draw a clear legend (4marks)
- e. Assuming the total budget for the provided drawing is Ksh. 10 million, provide the Bill of Quantities for the Electrical Services. Consider the labour costs separately in the BOQ. Assume the costs of some of the equipment is as shown below:
- Pin bulbs- Ksh.100 -300
 - Fluorescent bulbs – Ksh. 1000- 1500
 - Sockets – Ksh 200- 4000
 - Smoke detectors: Ksh. 10000-50000
 - Emergency Exits and Exit signs: 300- 5000
 - Cameras: 90degree – Ksh. 15000 – 30000
180 degree – Ksh.45000- 60000
360 degree – Ksh. 70000-120000

(10marks)

Note: You need to draw a total of 3 diagrams (Layout Diagram/drawing, Power Layout Diagram, and Electrical Load Schedule table.)

Illuminance - Recommended Indoor Light Levels

Activity	Illuminance (lx, lumen/m ²)
Public areas with dark surroundings	20 - 50
Simple orientation for short visits	50 - 100
Areas with traffic and corridors - stairways, escalators and travelators - lifts - storage spaces	100
Working areas where visual tasks are only occasionally performed	100 - 150
Warehouses, homes, theaters, archives, loading bays	150
Coffee break room, technical facilities, ball-mill areas, pulp plants, waiting rooms,	200
Easy office work	250
Class rooms	300
Normal office work, PC work, study library, groceries, show rooms, laboratories, check-out areas, kitchens, auditoriums	500
Supermarkets, mechanical workshops, office landscapes	750
Normal drawing work, detailed mechanical workshops, operation theaters	1000
Detailed drawing work, very detailed mechanical works, electronic workshops, testing and adjustments	1500 - 2000
Performance of visual tasks of low contrast and very small size for prolonged periods of time	2000 - 5000
Performance of very prolonged and exacting visual tasks	5000 - 10000
Performance of very special visual tasks of extremely low contrast and small size	10000 - 20000